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LOAD BALANCING AND DYNAMIC CONTROL OF MULTIPLE DATA STREAMS IN A NETWORK

ABSTRACT OF THE DISCLOSURE

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Available bandwidth utilization during transfer of large files over a TCP/IP network is improved by load balancing data streams at the initiation of a large data transfer and dynamically controlling the number of data streams utilized as conditions within the infrastructure environment change. Software code running in both the client and the server optimizes the number of data streams utilized for each data transfer. A determination is quickly made of the optimum number of data streams for a particular data file transfer in the early stage of transmission. During the first few seconds of the transfer, an initial number of data streams, which is one unless otherwise specified or determined, is used to transmit one or more file segments, each on a different data stream, immediately followed by a second initial number of data streams, which is at least two greater than the initial number of data streams, is used to transmit another portion of the large data file. During each transmission, individual and aggregate transmission bandwidths are determined. The transfer proceeds with the second number of data streams if its aggregate transmission bandwidth is substantially greater than that of the initial number of data streams. Thereafter, during continuous transfer of the large data file, a weighted average of aggregate transmission bandwidth is periodically determined and compared for the active set of data streams. Responsive to a determination that the latest aggregate transmission bandwidth is significantly different from the previous aggregate transmission bandwidth, the number of data streams is modified as conditions in the infrastructure dictate.

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